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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LU, TOM Y	

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/707,085	OUYANG ET AL.	
	Examiner	Art Unit	
	Tom Y Lu	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 12-28* is/are rejected.

7)☒ Claim(s) *9-11,29 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment and written response filed on 11/26/2004 has been entered.

2. Claim 31 has been cancelled.

3. Claims 1, 5, 8, 9, 12, 15, 18 and 21 have been amended.

4. Claims 1-30 are pending.

Response to Arguments

5. Applicant's arguments, see Remarks, filed 11/26/2004, with respect to the rejection(s)of claim(s) 1-30 under 102/103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Okuda et al (U.S. Patent No. 5,625,703), Banker et al (U.S. Patent No. 6,275,600 B1), Kamprath et al (U.S. Patent No. 5,278,624) and Rushing et al (U.S. Patent No. 5,546,165).

Claim Objections

6. Claim 8 is objected to because of the following informalities: a typographical error is found. "a close feedback loop" should be corrected to "a closed feedback loop". Appropriate correction is required.

7. Claim 21 is objected to because the limitation of "processor" in line 8 should be "said processor", otherwise it would not be a closed feedback loop method.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-7, 18-20, 23-24 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuda et al (U.S. Patent No. 5,625,703) in view of Banker 6,275,600 B1).

a. Referring to Claim 1, Okuda discloses in a printing system (a defective printed matter detecting apparatus as shown in figure 1, column 3, line 6), a closed feedback loop method (a test image scanned by the scanning head 1 is feedback to a signal processor 2 for comparison, and the test image is provided by the signal processor 2 according to a reference image stored in a reference memory 6, see figure 1) for detecting defects of a printed image to analyze print quality of the printed image, said method comprising the steps of: providing original first image data for printing an image in the printing system (a reference image stored in reference memory 6 is provided to be printed as a test image, column 6, line 38); printing on a substrate the original image (the test image is printed on a sheet of paper. Note although, Okuda does not explicitly teach what the test image is printed on, it is reasonable to assume that the test image is printed on a sheet of paper); scanning the printed image to obtain second image data wherein the second image data wherein the second image data is feedback to printing system in a closed loop manner (the scanning head 1 scans the printed test image and feed it back to signal processor 2 as shown in figure 1); comparing the second image data to the first image data on a pixel by pixel basis (signal processor 2 contains difference circuit 9 compares the pixels of the test image stored in

detection memory 7 and the reference image stored in the reference memory 6 based on a pixel by pixel basis, column 4, lines 45-60); and analyzing the comparison of the first image data to the second image data to determine print quality of the printed image (column 4, lines 45-60). In Okuda's reference, Okuda is silenced on the skewing and registration of the scanned test image, and assumes the image pixel positions of the reference image and which of the test image are the same, therefore, there is no explicit teaching in Okuda as to how the skewing and registration detection/correction is performed. Apparently, applicant has recognized the assumption by the Okuda, and incorporated reference marks to compensate the skewing and registration. However, Banker also recognizes that and provides a teaching by printing landmarks as shown in figure 2 on the corners, and analyzing such landmarks to correct the skewing and registration problems may be caused by the scanner. Naturally, by adding the landmarks on the corners of the test image, the pixel locations of the image data to the landmarks become relative, and upon completion of the skewing and registration detection/correction, the pixel locations of the reference image and which of the test image become the same. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to adapt Banker's skewing and registration method in Okuda's system to align the test image pixels with reference image pixels to perform a comparison because Banker's method provides a necessary step in Okuda to perform such pixel comparison, and the adaptation of the Banker's teaching enables a reasonable expectation of success.

b. Referring to Claim 2, Okuda does not explicitly teach wherein said first image data is originated from an image scanner for reading an original. Banker at column 2, lines 38-39, teaches bitmap 12 or reference image as described in Okuda can be produce by scanning. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use any means to obtain a reference image and store the reference in memory storage, use of a scanner as taught by Banker is one of them. Additionally, it is apparent to the examiner, as long as the reference is accessible to the processor, the means of obtaining a reference image is not critical to the invention, therefore, no significant patentable weight is given to the origin of the reference image.

c. Referring to Claim 3, Okuda does not explicitly teach wherein said first image data is originated from a computer system that generates an image that is printed in the printing system. Banker teaches it can be generated electronically within a printing system 10, column 2, line 40. The motivation is provided in Claim 2.

d. Referring to Claim 4, the combination of Okuda and Banker teaches wherein said reference mark is added to one of corners in the image (see figure 2 in Banker).

e. Referring to Claim 5, the combination of Okuda and Banker teaches wherein comparing step comprises the steps of: acknowledging the one or more reference marks in the second image data (in the process of detecting/correcting skew and registration in Banker, the reference marks in second image data is acknowledged); comparing a pixel of the first image data with a pixel of the second image data at the same location relative to the one or more reference

marks (upon completion of the skewing and registration detection/correction, the image pixel positions of the reference image and which of test image are the same, and the pixels of both image are compared as described at column 4, lines 45-48 in Okuda); calculating a difference between the first image data and the second image data for each pixel (column 4, lines 45-48 in Okuda); examining the difference of a pixel between the first image data and the second image data to determine whether the pixel of the second image is defective or not (column 4, lines 54-57 in Okuda).

f. Referring to Claim 6, the combination of Okuda and Banker teaches inputting a threshold value of the difference for determining whether a pixel of the second image is defective or not (column 4, line 56 in Okuda, a predetermined value).

g. Referring to Claim 7, the combination of Okuda and Banker teaches counting the number of defective pixels in the second image, and where the number of defective pixels is greater than a predetermined value (column 4, lines 57-60 in Okuda); controlling the printing system to stop printing or auto-purge the defective image from the system (stop printing or auto-purge the defective image are simply actions taken upon detection of defects in printing, these actions are not critical to the invention and should not carry any patentable weights. Although Okuda does not explicitly teach stopping the printing or auto-purge the defective image from the system, it is understood in the art such actions can be taken upon detection of defects).

h. Referring to Claim 18, Okuda discloses in a printing system (a defective printed matter detecting apparatus as shown in figure 1, column 3, line 6), a closed feedback loop method (a test image scanned by the scanning head 1 is feedback to a signal processor 2 for comparison, and the test image is provided by the signal processor 2 according to a reference image stored in a reference memory 6, see figure 1) for defects, said method comprising the steps of: providing first image data for printing an image in the printing system (a reference image stored in reference memory 6 is provided to be printed as a test image, column 6, line 38); printing the image (the test image is printed); scanning the printed image to obtain second image (the printed test image is scanned and feed back to the signal processor 2). However, Okuda does not explicitly teach detecting skew of the printed image based on the analysis of the printed image. Banker teaches comparing the first image and the second image to detect skew of the printed image based on the analysis (column 3, lines 31-46 in Banker). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to adapt Banker's skewing detection technique in Okuda's system because Okuda's system requires the second image data to be deskewed to enable the pixel positions of the first image data and which of the second image data to be the same in order to carry out further analysis for the second image data.

i. With regard to Claim 19, see explanation in Claim 1.

j. Referring to Claim 20, the combination of Okuda and Banker teaches wherein comparing step comprises the steps of: acknowledging the one or more reference

marks in the second image data (in the process of detecting/correcting skew and registration in Banker, the reference marks in second image data is acknowledged); comparing a pixel of the first image data with a pixel of the second image data at the same location relative to the one or more reference marks (upon completion of the skewing and registration detection/correction, the image pixel positions of the reference image and which of test image are the same, and the pixels of both image are compared as described at column 4, lines 45-48 in Okuda); calculating a difference between the first image data and the second image data for each pixel (column 4, lines 45-48 in Okuda); examining the difference of a pixel between the first image data and the second image data to determine whether the pixel of the second image is defective or not (column 4, lines 54-57 in Okuda).

k. Referring to Claim 23, the arguments in Paragraph 12.a below as to the applicability of Okuda are incorporated herein. See explanation in Claim 2.

l. Referring to Claim 24, the arguments in Paragraph 12.a below as to the applicability of Okuda are incorporated herein. See explanation in Claim 1.

m. Referring to Claim 26, the arguments in Paragraph 12.a below as to the applicability of Okuda are incorporated herein. See explanation in Claim 4.

n. Referring to Claim 27, the arguments in Paragraph 12.a below as to the applicability of Okuda are incorporated herein. See explanation in Claim 5.

o. Referring to Claim 28, the arguments in Paragraph 12.a below as to the applicability of Okuda are incorporated herein. See explanation in Claim 7.

9. Claims 8 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuda in view of Rushing et al (U.S. Patent No. 5,546,165).

a. Referring to Claim 8, Okuda discloses in a printing system (a defective printed matter detecting apparatus as shown in figure 1, column 3, line 6), a closed feedback method (a test image scanned by the scanning head 1 is feedback to a signal processor 2 for comparison, and the test image is provided by the signal processor 2 according to a reference image stored in a reference memory 6, see figure 1) for detecting defects of a printed image to analyze print quality of the printed image, said method comprising the step of: generating a image (reference image is generated and stored in reference memory 6); printing the image (test image is printed); scanning the printed image wherein the image data is feed back to the printing system in a closed loop manner (test image is scanned and feed back to signal processor 2); and comparing the printed image to the original generated image (column 4, lines 45-60); and analyzing the comparison of the printed to the original image to determine print quality of the printed image (column 4, lines 45-60). However, Okuda does not explicitly teach the image is a half-tone image. Rushing in figure 6 teaches printing a halftone image and scanning the halftone image to compare the halftone levels of image pixels in the printed halftone image with desired halftone levels of which stored in memory, column 7, lines 11-48, note such desired halftone level of image data is similar to reference image data stored reference memory in Okuda, or claimed "halftone value of original image". At the time the invention was made, it would have been

obvious to a person of ordinary skill in the art to use Okuda's system to detect defects in a halftone image because Okuda already teaches detecting pixel defects using closed feedback loop method in image printing environment by comparing stored reference image data with scanned test image data, Rushing also teaches the idea of determining defects in halftone image by comparing scanned halftone image data with a stored image data, therefore, it would be reasonable for a person of ordinary in the art to assume Okuda's system can be modified in accordance with Rushing's teaching to detect defects in a halftone image.

b. Referring to Claim 25, the arguments in Paragraph 12.a below as to the applicability of Okuda are incorporated herein. As explained in Claim 8, Okuda does not explicitly teach the reference image stored in the reference memory 6 is a halftone image, and printing the halftone reference image as a test image. However, Rushing teaches a halftone image can be created and printed and later used to detect defects. The motivation of combining Okuda and Rushing is provided in Claim 8. Note a halftone image inherently contains at least one halftone values.

10. Claims 12 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuda et al in view of Kamprath et al (U.S. Patent No. 5,278,624).

a. Referring to Claim 12, Okuda discloses in a printing system (a defective printed matter detecting apparatus as shown in figure 1, column 3, line 6), a closed feedback loop method (a test image scanned by the scanning head 1 is feedback to a signal processor 2 for comparison, and the test image is provided by the signal

processor 2 according to a reference image stored in a reference memory 6, see figure 1) for detecting defects of a printed image to analyze print quality of the printed image, said method comprising the steps of: providing first image data for printing an original image in the printing system (a reference image stored in reference memory 6 is provided to be printed as a test image, column 6, line 38); printing the original image based on the first image data (the test image is printed on a sheet of paper); scanning the printed image to obtain second image data (scanning head 1 scans the test image, and feed back the scanned image data back to the signal processor 2); and comparing the second image to the first image data on a pixel by pixel basis, pixel locations of the second image data being assumed the same as pixel locations of the first image data (column 4, lines 45-60). Okuda does not explicitly teach the scanning of test image performed after the completion of the registration and skewing detection/correction, albeit Okuda's difference circuit 9 performs differencing process based on the assumption of pixel locations of reference image and which of test image are the same. Kamprath in abstraction section, and column 2, lines 36-41, teaches performing registration and deskewing process during the printing of an image. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to adapt Kamprath's registration and deskewing process in Okuda's system because the adaptation allows Okuda's system to correct any misaligning deficiency in the printer before scanning of the printed test image as to make sure the pixel positions of reference image and test image are at the same position.

b. Referring to Claim 15, the combination of Okuda and Kamprath teaches comparing a pixel of the first image data with a pixel of the second image data at the same location relative to the one or more reference marks (upon completion of the skewing and registration detection/correction, the image pixel positions of the reference image and which of test image are the same, and the pixels of both image are compared as described at column 4, lines 45-48 in Okuda); calculating a difference between the first image data and the second image data for each pixel (column 4, lines 45-48 in Okuda); examining the difference of a pixel between the first image data and the second image data to determine whether the pixel of the second image is defective or not (column 4, lines 54-57 in Okuda).

c. Referring to Claim 16, the combination of Okuda and Kamprath teaches inputting a threshold value of the difference for determining whether a pixel of the second image is defective or not (column 4, line 56 in Okuda, a predetermined value).

d. Referring to Claim 17, the combination of Okuda and Kamprath teaches counting the number of defective pixels in the second image, and where the number of defective pixels is greater than a predetermined value (column 4, lines 57-60 in Okuda); controlling the printing system to stop printing or auto-purge the defective image from the system (stop printing or auto-purge the defective image are simply actions taken upon detection of defects in printing, these actions are not critical to the invention and should not carry any patentable weights. Although Okuda does not explicitly teach stopping the printing or auto-purge the defective

image from the system, it is understood in the art such actions can be taken upon detection of defects).

11. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuda and Kamprath as applied to claim 12 above, and further in view of Banker.

a. Referring to Claim 13, the combination of Okuda and Kamprath does not explicitly teach wherein said first image data is originated from an image scanner for reading an original. Banker at column 2, lines 38-39, teaches bitmap 12 or reference image as described in Okuda can be produce by scanning. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use any means to obtain a reference image and store the reference in memory storage, use of a scanner as taught by Banker is one of them. Additionally, it is apparent to the examiner, as long as the reference is accessible to the processor, the means of obtaining a reference image is not critical to the invention, therefore, no significant patentable weight is given to the origin of the reference image.

b. Referring to Claim 14, the combination of Okuda and Kamprath does not explicitly teach wherein said first image data is originated from a computer system that generates an image that is printed in the printing system. Banker teaches it can be generated electronically within a printing system 10, column 2, line 40. The motivation is provided in Claim 2.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Okuda et al.

a. Referring to Claim 21, Okuda discloses an apparatus (a defective printed matter detecting apparatus, column 3, lines 6-7) for detecting defects of a printed image to analyze print quality of the printed image wherein a closed feedback loop method (a test image scanned by the scanning head 1 is feedback to a signal processor 2 for comparison, and the test image is provided by the signal processor 2 according to a reference image stored in a reference memory 6, see figure 1) is utilized, said apparatus comprising: a processor (a signal processor 2, column 3, line 15) for generating first image data for printing an image (a reference image stored in reference memory 6 is printed to create a test image); a printing engine for printing the image on a substrate based on the first image data (test image is printed on a sheet of paper); a scanner (scanning head 1, column 3, line 8) for scanning the printed image to obtain a second image data and for sending second image to said processor in a closed feedback loop method (scanning head 1 scans the printed test image, and store it in detection memory 7); and wherein said processor compares the second image data with the first image data to detect defects of the printed image and determine the print quality (processor 2 contains

a difference circuit 9 to compare the test image and the reference image on a pixel by pixel basis, column 4, lines 45-60).

b. Referring to Claim 22, Okuda discloses inputting a threshold value of the difference for determining whether a pixel of the second image is defective or not (column 4, line 56 in Okuda, a predetermined value).

Allowable Subject Matter

13. Claims 9-11 and 29-30 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Bares, U.S. Patent No. 5,057,936, see whole document.

b. Moscato et al, U.S. Patent No. 6,335,978 B1, see figure 2.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Y Lu whose telephone number is (571) 272-7393. The examiner can normally be reached on 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Y. Lu

JOSE L. COLE
PRIMARY EXAMINER